



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/715,769

11/18/2003

Iwao Inagaki

JP920020212US1

5257

25259

7590

06/06/2006

IBM CORPORATION

3039 CORNWALLIS RD.

DEPT. T81 / B503, PO BOX 12195

REASEARCH TRIANGLE PARK, NC 27709

EXAMINER

RUTTEN, JAMES D

ART UNIT

PAPER NUMBER

2192

DATE MAILED: 06/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/715,769

Applicant(s)

INAGAKI ET AL.

Examiner

J. Derek Rutten

Art Unit

2192

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/18/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-22 have been examined.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “unrestricted execution” (claims 6 and 17) and the execution blocking (claims 7 and 18) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet”

Art Unit: 2192

pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 1-5 and 12-16 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 1 is directed to an “information processor” and recites means for “registering a routine” and “determining a level of a tracing process”. However, these limitations do not produce a useful and tangible result. The elements of the claim are necessary for providing the utility as disclosed in the specification (e.g. page 2 paragraph [008] and page 6 paragraph [030]), but does not actually provide any useful result in the form of enabling control or analysis of threads or routines that access shared resources. In contrast, claim 6 is exemplary for using an indication of “permission...for unrestricted execution” of identically registered routines. In this case a useful and tangible result is obtained, and the claim is statutory. Claim 12 is a method claim including similar limitations to claim 1, and is rejected for the same reasons as provided above. Claims 2-5 and 13-16 are dependent upon rejected base claims and are rejected for similar reasons as presented above.

6. For further information, see Official Gazette, Nov. 22, 2005, 1300 OG 142, “Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility”, which can be found online at <http://www.uspto.gov/web/offices/com/sol/og/2005/week47/patgupa.htm>.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-4, 8, 9, 12-15, 19, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,055,492 to Alexander et al. (hereinafter “Alexander”).

In regard to claim 1, Alexander discloses:

An information processor suitable for executing a routine (See FIG. 2) including a tracing process for collecting information related to multithreading processing status, the information processor comprising:

routine registration means for registering a routine being executed for each thread being activated; and See column 6 lines 25-28:

The time, type of event (i.e. in this case, whether the event is a method entry or exit), the name of the module (i.e. method), location of the thread's call stack, and location of the thread's "current tree node" are then obtained (step 172).

level determination means for determining a level of a tracing process for the routine being executed based on registration information registered by the routine registration means. See column 6 lines 37-39:

If the trace event is an enter event, a check is made to determine if the module is already a child node of the current tree node (step 180).

In regard to claim 2, the above rejection of claim 1 is incorporated. Alexander further discloses: *wherein the level determination means performs the level determination of the tracing process for the routine being executed based on whether a routine identical to, or in a predetermined relation with, the routine is registered.* See column 6 lines 37-43.

In regard to claim 3, the above rejection of claim 2 is incorporated. Alexander further discloses: *a table in which routines having a predetermined mutual relation are specified.* See FIG. 3.

In regard to claim 4, the above rejection of claim 3 is incorporated. Alexander further discloses: *means for accepting input for setting or changing the table.* See column 4 lines 18-20.

In regard to claim 8, the above rejection of claim 1 is incorporated. Alexander further discloses: *wherein, responsive to registration of a routine, the level determination means adds, if there is already registered a routine identical to or in a predetermined relation with the routine being registered, simultaneous execution information to registration information of both the routine being registered and the routine already registered.* See column 5 lines 50-52.

In regard to claim 9, the above rejection of claim 8 is incorporated. Alexander further discloses: *wherein the simultaneous execution information includes trace level information indicating the level of the tracing process*. See column 5 lines 47-48.

In regard to claims 12-15, 19, and 20, Alexander discloses a tracing method. See FIG. 6. All further limitations have been addressed in the above rejections of claims 1-4, 8, and 9, respectively.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 5 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alexander as applied to claims 2 and 13 above, and further in view of “Visualization and Performance Prediction of Multithreaded Solaris Programs by Tracing Kernel Threads” by Broberg et al. (hereinafter “Broberg”).

In regard to claim 5, the above rejection of claim 2 is incorporated. Alexander does not expressly disclose: *routines that access a shared resource*. However, Broberg teaches tracing routines, such as user level threads and kernel threads, that access shared I/O resources. See page 1 column 2 paragraph 2. It would have been obvious to one of

ordinary skill in the art at the time the invention was made to use Broberg's teaching of shared resources with Alexander's routines. One of ordinary skill in the art would have been motivated to trace such routines in order to handle various I/O activities as suggested by Broberg (page 1 column 2 paragraph 2).

In regard to claim 16, the above rejection of claim 13 is incorporated. All further limitations have been addressed in the above rejection of claim 5.

11. Claims 6, 7, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alexander as applied to claims 1 and 12 above, and further in view of "Efficient Program Tracing" by Larus (hereinafter "Larus").

In regard to claim 6, the above rejection of claim 1 is incorporated. Alexander does not expressly disclose: *wherein the level determination means indicates permission, in determining the level of the tracing process for the routine being executed, for unrestricted execution of a tracing process if a routine identical to, or in a predetermined relation with, the routine being executed is registered.* However, Larus teaches a level determination scheme that provides an indication of unrestricted execution upon encountering "impossible instructions" (see page 57 column 1). These instructions must inherently be "registered", otherwise there would be no way for the tracing system to know if they are "impossible instructions" or not. It would have been obvious to one of

ordinary skill in the art at the time the invention was made to use Larus' teaching of unrestricted execution permission with Alexander's level determination means in order to provide an accurate program trace as suggested by Larus.

In regard to claim 7, the above rejection of claim 1 is incorporated. Alexander does not expressly disclose: *wherein the level determination means blocks, in determining the level of the tracing process for the routine being executed, execution of a tracing process unless a routine identical to, or in a predetermined relation with, the routine being executed is registered.* However, Larus teaches that certain types of instructions in an address slice do not need to be traced unless they are registered as "impossible instructions" (See page 57 bottom of column 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Larus' teaching of blocking tracing instructions with Alexander's methods in order to reduce the information that must be collected as suggested by Larus.

In regard to claims 17 and 18, the above rejection of claim 12 is incorporated. All further limitations have been addressed in the above rejection of claims 6 and 7, respectively.

12. Claims 10 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alexander as applied to claims 1 and 12 above, and further in view of "Debugging with GDB" by the Free Software Foundation, Inc. (hereinafter "GDB").

In regard to claim 10, the above rejection of claim 1 is incorporated. Alexander discloses a trace executioner that provides level determination (See column 6 lines 37-39) and an application execution control part for executing the routine (inherent in execution of a program trace, otherwise the routine would not execute). Alexander does not expressly disclose: *a server program including the routine and the tracing process; ...executing the routine in response to a call of the routine by a client program; and ... executing the tracing process in response to a request by the application execution control part.* However, GDB teaches such a system of tracing using a server that responds to requests by a client in order to control application execution and tracing. See at least the first 3 paragraphs of chapter 10 “Tracepoints” in addition to supporting documentation in chapters 16 and 17. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use GDB’s teaching of distributed tracing with Alexander’s application executioner and trace executioner in order to trace applications that require flexible execution environments, as suggested by GDB (see Chapter 16).

In regard to claim 21, the above rejection of claim 12 is incorporated. All further limitations have been addressed in the above rejection of claim 10.

Art Unit: 2192

13. Claims 11 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alexander as applied to claims 1 and 12 above, and further in view of U.S. Patent No. 6,163,881 to Sauvage (hereinafter "Sauvage").

In regard to claim 11, the above rejection of claim 1 is incorporated. Alexander further discloses: *a program for using the routine including a tracing process (as depicted in FIG. 4); ... and a trace executioner for executing the tracing process in response to a request by the routine used by the program (as depicted by the trace record of FIG. 3); wherein the trace executioner inquires, when executing the tracing process, the level determination means to determine the level of the tracing process (See column 6 lines 37-39).* Alexander does not expressly disclose: *a shared library in which the routine including the tracing process is stored.* However, Sauvage teaches using shared libraries to interface with programs. See FIG. 4. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Sauvage's shared library with Alexander's routines and tracing process in order to simplify complex programs as suggested by Sauvage (column 1 lines 16-25).

In regard to claim 22, the above rejection of claim 12 is incorporated. All further limitations have been addressed in the above rejection of claim 11.

Conclusion

Any inquiry concerning this communication or earlier communications from the

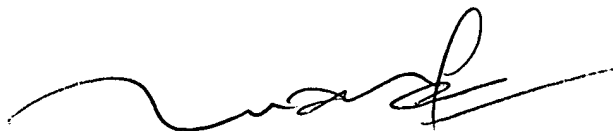
Art Unit: 2192

examiner should be directed to J. Derek Rutten whose telephone number is (571) 272-3703. The examiner can normally be reached on T-Th 6:00-6:30, F 6:00-10:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on (571) 272-3695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

jdr



TUAN DAM
SUPERVISORY PATENT EXAMINER